CLAIMS

We Claim:

1. A mass spectrometer, comprising:

   (a) an ion source for generating and accelerating ions along a flight path;

   (b) a flight tube downstream from said ion source for shielding said ions;

   (c) an ion mirror integral to said flight tube, comprising:
   a front electrode, middle electrode and a rear electrode, each of said electrodes designed for receiving ions and creating an electric field which retards and reflects said ions; and

   (d) an ion detector for receiving ions reflected from said ion mirror.

2. A mass spectrometer as recited in claim 1, wherein at least one of said electrodes comprises a conductive material.

3. A mass spectrometer as recited in claim 2, wherein said conductive material is a metal.

4. A mass spectrometer as recited in claim 3, wherein said metal is selected from the group consisting of gold, aluminum, nickel, chromium and titanium.

5. A mass spectrometer as recited in claim 1, wherein said flight tube comprises a material selected from the group consisting of quartz, glass, fused silica and ceramic.

6. A mass spectrometer as recited in claim 1, wherein the electric field produced by said ion mirror deviates only slightly from a linear mirror with constant field strength.

7. An ion mirror integral to a flight tube, comprising a front electrode, middle electrode and rear electrode, each of said electrodes designed for receiving ion and creating an electric field which retards and reflects ions.

8. An ion mirror as recited in claim 7, wherein at least one of said electrodes comprises a conductive material.

9. An ion mirror as recited in claim 8, wherein said conductive material is a metal.

10. An ion mirror as recited in claim 9, wherein said metal is selected from the group consisting of gold, aluminum, nickel, chromium and titanium.

11. An ion mirror as recited in claim 7, wherein said flight tube comprises a material selected from the group consisting of quartz, glass, fused silica and ceramic.

09/541,101